



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/945,553

08/30/2001

Fernando Gonzalez

303.775US1

1842

21186

7590

06/26/2006

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.

P.O. BOX 2938

MINNEAPOLIS, MN 55402

EXAMINER

FOURSON III, GEORGE R

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 06/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/945,553

Applicant(s)

GONZALEZ ET AL.

Examiner

George Fourson

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 5-7, 9-12, 14, 15, 17-22 and 30-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 5, 6, 9, 10, 11, 12, 14, 15 and 17-22 is/are rejected.
- 7) ☒ Claim(s) 7 and 30-35 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Claims 7 and 30-35 are now seen as linking claims. Claims 1,5,6,7,9-12,14,15,17-22 and 30-35 are under consideration.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1,5,6,9,10,11,12,14,15 and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Weimer et al 2001/0014522 and Pan 6198144.

Weimer et al '522 discloses formation of a gate stack including gate dielectric layer 106, polysilicon layer 104, metal nitride barrier layer 102, metal layer 100, patterning of the gate stack, formation of nitride or oxide spacers 114A and 114B and selective oxidation of the polysilicon layer using a specific atmosphere to reduce or prevent oxidation of the metal layer 100 [0034]-[0043]. Note that the selective oxidation process is disclosed to be useful notwithstanding the presence of the spacers. The reference does not disclose providing  $\text{NF}_3$  during the selective oxidation process.

Pan '144 discloses formation of a polymetal gate stack such as that of Weimer et al '522, formation of nitride spacers and oxidation using  $\text{NF}_3$  wherein the nitride spacers prevent or reduce oxidation of the metal layer (col.3, lines 17-22). The reference also discloses that little or none of the barrier layer and metal layer is converted to oxide.

It would have been obvious to one of ordinary skill in the art to employ a temperature range during the reoxidation step of Pan such that a portion of the metal is converted to oxide in view of the disclosures

Art Unit: 2823

of Pan and Weimer that such an embodiment is contemplated as being within the scope of both of the disclosed processes, which indicates that oxidation of a portion of the metal layer does not render the device inoperable. Pan instead indicates that certain disadvantages are obtained when the gate metal is converted to oxide as opposed to rendering the device inoperable (col.2, lines 1-16). Weimer also discloses a disadvantage of excessive metal oxidation. One of ordinary skill in the art would have had a reasonable expectation of success in producing a useful device using a temperature range in which a portion of the metal is oxidized during the reoxidation step of Pan while using a temperature range wherein excessive oxidation of the metal is prevented.

Applicant argument that in the process of Pan oxidation is completely prevented is addressed in the statement of the rejection above.

Claims 7 and 30-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Linking claims 7 and 30-35 have been indicated as containing allowable subject matter. See MPEP 809.03.

Art Unit: 2823

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Fourson whose telephone number is (571) 272-1860. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'George Fourson', is positioned above the printed name.

George Fourson  
Primary Examiner  
Art Unit 2823

GFourson  
June 14, 2006